

LITERATURE REVIEWS COMPARISON ESSAY ON TRAVEL FOCUSING ON TRAVEL NEED, TRAVEL BEHAVIOUR AND TRAVEL PATTERN.

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ABSTRACT

Understanding the previous, present and to date research studies on travel in terms of factors that influence such phenomenon as well as response to changes in circumstances that matters are an important component in assessing and projecting future travel-related issues and matters. Defined as 'trip or multi-trips made from origin to destination' or 'moving any distance by any means of transportation' (Mokhtarian, Salomon and Redmond, 2001), travel whether in the form of vehicle mode or non-vehicle mode, has always been part of human daily activity. Timmermans et. al (2003) well thought-out travel into two positions namely (1) trip which defined as movement between two activities carried out at different locations and (2) tour which defined as a sequence of trips where it starts and ends at the same location. To date, studies focusing on travel have it classified and categorized travel into different groups depending on the travel-related field studied as well as by the breadth of the domains which they are likely to affect. This paper attempted to draw some conclusion with regard how a certain parameter influences one's travel in terms of travel needs, travel behaviors as well as travel patterns. Not to mention that pervasiveness of habits, personal circumstances and other factors takes place over time, some of the studies presented provide evidence that a certain parameter works uniquely on two different individual.

Keywords : travel behavior, travel need, travel pattern, demography, urban form.

1. INTRODUCTION

Defined as 'trip or multi-trips made from origin to destination' or 'moving any distance by any means of transportation' (Mokhtarian, Salomon and Redmond, 2001), travel whether in the form of vehicle mode or non-vehicle mode, has always been part of human daily activity. Timmermans et. al (2003) well thought-out travel into two positions namely (1) trip which defined as movement between two activities carried out at different locations and (2) tour which defined as a sequence of trips where it starts and ends at the same location. To date, studies focusing on travel have categorized travel into different groups depending on the travel-related field studied. Literature reviews of travel studies (travel studies typology) can be summarized and organized in any number of ways for example, by travel mode (private transportation, public transportation, walking, cycling, etc), by travel purpose (work-related trip, entertainment-related trip, emergency-related trip, trip chains, etc), by travel demand (aging population, vehicle ownership, income level, etc), travel studies analytical methods (regression, cross tabulation, simulation, etc) or urban forms' measures and characteristics (street pattern, accessibility, urban density, etc). In addition, travel researches can suitably be assorted into groups of travel behavior or travel pattern (see Crane, 2000 and Morikawa, 2001).

The purpose of this article is to provide an overview of this foundation and to draw conclusion with regard how a certain parameter influences one's travel in terms of travel needs, travel behaviors as well as travel patterns. Not to mention that pervasiveness of habits, personal circumstances and other factors

takes place over time, some of the studies presented provide evidence that a certain parameter works uniquely on two different individual. The following section of this paper consists of literature review where some of the studies selected will illustrate travel practice and to review the results of the studies and ends with conclusion where this section serves the purpose of giving some insights and a better ground for the future research.

2. LITERATURE COMPARISON

According to Mokhtarian, Salomon and Redmond (2001), travel is not purely derived. Simply put, travel is made not only because there is a need for travel or for the sake of getting to the destination. Travel has value of its own and also an intrinsic positive utility that is to say that, a certain positive factors or characteristics that lead some people to engage in travel might not be working on the same condition to the others. This suggestion is much similar with the fact pointed by Michel de Montaigne (1957), Robert Louis Stevenson (1879) and Bruce Chatwin (1989) where in these literature reviews, travel is described as 'an activity which man took pleasure in doing it. People love to travel for the sake of travel itself where there are times when travel itself is the desired activity' (as cited by Mokhtarian, Salomon and Redmond, 2001).

By examining travel's 11 most measured variables, this study was carried out to serve the intention of having clear policy implications. Results show that rather than determined by demographically-based needs (age, income, gender, level of education), travel is much more influenced by traveler's attitude toward travel. Additionally, findings also pointed out those demographically-based needs are positively related to travel engagement when subjective variables such as travel liking, the adventure-seeker personality, the travel stress attitude as well as the excess travel indicator were evaluated jointly. Study concluded that the intention of reducing vehicle miles traveled (VMT) will have to depend on the traveler's desirability whether they desire more or less mobility than they currently experienced. Much similar to the conclusion, Sperling (1995) in *Future Drive : Electric Vehicles and Sustainable Transportation* (as cited by Simich and Gilbert, 1998) wrote that people stand firm with better technology innovation for benign transportation system approach over behavior 'reconstruction' and changes.

Just like 'cars will now have to adapt to the city' approach adopted by Amsterdam (The New York Times, 1993 as cited by Simich and Gilbert, 1998); other certain approaches for example increases road pricing, limited parking space and parking time proved to be insufficient to assist travel demand (Crane, 2000 and Mohamad, unpublished). Other than that, Kain and Fauth (1977) provide evidence that even though urban form does play a role in influencing travel engagements, people tend to travel once they have access to cars (as cited by Crane 2000). Sperling (1995) in *Future Drive : Electric Vehicles and Sustainable Transportation* (as cited by Simich and Gilbert, 1998) noted down that affection to cars derives from the unparalleled freedom, privacy, security and convenience that cars provide (see also Mohamad and T. Kiggundu, 2007).

Seeing travel from different angles, some transportation scholars are opposed to Mokhtarian, Salomon and Redmond (2001). Attempt to seek the academics' opinion on telecommuting working arrangement, Mohamad (unpublished) indicated that if travel time and travel cost is to increase by 50%, people will tend to save-up and divert private travel needs by engaging in another transportation mode (see also Shalom Reichman 1976 and Peter Jones 1978 as cited by Mokhtarian, Salomon and Redmond, 2001). Though holds its own value, travel is made not just for the sake of travel itself. Purpose, fuel price and other factors are calculated before the trip is made (Centre for Sustainable Transportation, 1998). As stated earlier, looking from the perspective of urban form, significant influence is detected where urban density, street pattern as well as pedestrian facilities play a role in 'manipulating' the travel pattern (see Susilo and Kitamura 2006; and Crane Randall 2000 as cited in Ewing 1977; Stone, Foster and Johnson 1992; Giuliano and Small 1993; McNally and Ryan 1993; Rabiega and Howe 1994). Rutherford, McCormack and Wilkison (1996) who concerned and engrossed with research question 'to what extent will behavior corresponds to various land use and design characteristics' attempted to summarize actual travel behavior. Although urban density can be replicated, this study supported the idea of household's travel amount can be reduced by mixed-use development (as cited by Crane Randall 2000).

Susilo and Kitamura (2006) provide the contrary evidence to Cohen and Kocis (1980), Kollo and Purvis (1984) and Levinson and Kumar (1994). Based on behavioral hypotheses 'worker with longer commute tend to visit locations on the way to and from work' and 'worker with shorter commute tend to make a separate home-based trip chain after work', this study attempted to draw conclusion with regard structural changes in Japanese commuters' daily travel. Great transit terminals access in Osaka Metropolitan and longer commute explain the increase in the number of trip chains and decrease in time-spent for non-work activities for both transit commuters and auto commuters. Transit commuters in Osaka metropolitan, if to compare with auto commuters, were more mobile and had higher level of activity engagement. Moreover, the results show that transit commuter had shorter commute time than auto commuter due to high level of services (access) provided at the transit terminals. Thus, adopted hypotheses and conventional wisdom 'automobile is suited for trip chaining and auto commuter tend to chain trips' proved to be not suitable for all travel environment.

Morikawa (2001) generally agrees with conventional wisdom that increase in income level, low level of public transportation services, traveler's attitudes toward vehicle, and vehicle ownership (see also Mohamad and T. Kiggundu, 2007) are factors that manipulate travel behavior. Cohen and Kocis (1980), Kollo and Purvis (1984) and Levinson and Kumar (1994) who share the same assumption suggested that the trend of motorization and suburbanization has significantly influenced the way people traveled due to the flexibilities in auto travel which allow auto commuter to adapt to changes in the travel environment (as cited by Susilo and Kitamura, 2006). Morikawa (2001) showed that of those factors, insufficient public transportation services paired with increase in income level play a role in determining travel behavior in Kuala Lumpur.

Information presented one similarity between Bangkok, Kuala Lumpur and Manila where male travelers are significantly positive related to cars and motorcycles, unlike Nagoya's, which prefer cars to motorcycles. Nevertheless, higher public transportation modal share both in Bangkok and Manila than Kuala Lumpur explain the age variables where aged travelers' in Bangkok and Manila prefer public transportation to make trips. Black (2001) agreed that to a certain extent, public transportation serves as the social service for the aging population where this statement does imply that public transportation with required standards are needed by the targeted group. However, this does not support the fact that increases in an aging population will result in increases in bus-transit ridership. From his study research with regard to bus-transit ridership of the aging population in US, Black came up with clear notion that 'this trend is continuing today and while it will not eliminate the need for bus transit, it is suggestive that the mode will never again reach parity it held with motor vehicles'.

Doted on hypothesis 'new urbanism which exercising transit-oriented development will have people to ease automobile use significantly', Nelson and Niles (1999) sought to understand the relationship between market and non-work travel pattern through market dynamics in order to draw an insight with regard how commercial centers might be configured to maximize transportation benefits. Five consumer behavioral factors that influence non-work travel pattern were listed, namely: bargain hunting, comparison-shopping, preference for variety, location and schedule flexibility. Nelson and Niles (1999) proved that resistance occurs from local residents when changes in land-use are to be implemented. Moreover, research shares the same results as Downs (1994) where a certain number of commercial center transit-oriented based developments needed to serve targeted area sufficiently (as cited by Nelson and Niles, 1999) and also compact, mixed use commercial centers come together with complex trip patterns. Results of Nelson and Niles (1999), Sperling (1995, as cited by Simich and Gilbert, 1998) and Mohamad and T. Kiggundu (2007) are complementing each other in a way that all these studies generally agreed with 'people do values cars' hypothesis.

Using number of trips; number of tours and number of stops as research indicators and definition of travel as mentioned earlier, Timmermans et al (2003) did a comparison study with regard to what extent does spatial context influence travel behavior as well as sought whether travel patterns follow their own regularities, if any. Trip-related and tour-related questions (number of daily home-based trip/tour, number of daily trip/tour per person, average daily trip/tour ratio – data collected at day of the week level) revolving

around spatial context, households' types and transport mode used steered the study. Comparing United States, Japan, Canada, United Kingdom and Netherlands, study found the following results :

1. Japan (Fukuoka) results in significantly low number of daily home-based tours while United States (Portland) and Canadian metros show the opposite. [In Fukuoka case, study shares the same results as Susilo and Kitamura (2006) where high quality of public transportation services did influence traveler's trip chain patterns].
2. Number of home-based tours decreases if public transport is used.
3. Number of home-based tours does not seem to be manipulated by spatial setting and mode of transportation. [In a way, study provided the same results as Kain and Fauth 1976; Messenger and Ewing 1996 and O'Regan and Quigley 1998 (as cited by Crane 2000), however, one difference spotted where mode of transportation does seem to influence travel in these studies].
4. Male traveler tends to make single-stop trip compared to female traveler who tend to involve in trip-chaining. [Information complemented Kumar and Levinson (1995 – as cited by Timmermans et. al 2003) findings where women make significantly more trips than average number of home-based trips indicator].

It is widely known that transportation level of service, distance from home to workplace as well as socioeconomic issues significantly influence traveler's travel-related decisions. Study conducted by Hamed and Olaywah (1999) set to examine commuters' of private vehicle, bus and servis taxi travel-related decisions in Amman, Jordan with strong interest toward morning departure time to the workplace and types of after work activities. Information indicates that morning departure time to the workplace varies with difference factor has unique influence to different targeted group of commuters. Private car commuters seem to be influenced with presence of children factor while distance to service stop from home, age, gender as well as waiting time are the factors influencing bus and taxi commuters' morning departure time. Distance to the workplace has significant impact on all targeted groups where morning departure time is coherent with distance to the workplace, that is to say this information indirectly provide some insights about transportation system and management of the study area which dominated by the private transportation.

As for the types of after work activities (categorized into groups of household errands, home maintenance and business-oriented activities) Hamed and Olaywah (1999) noted that though there is no significant difference in targeted groups' departure time from work, this variable, on top of distance to the activity, mode of transportation together with whether the commuter's spouse is employed or not factors did influence the after work activities exercised. Provided with the unparallel accessibility, unlike bus and servis taxi commuters, private cars commuters tend to make home-based trip for a wide range of after work activities particularly household errands. Though the study generally agrees that most of the trips made were contributed by the private vehicles, however, if the distance to the activity increases, private cars commuters as well as bus and servis taxi commuters are less likely to perform the activity. In a way, this is slightly differs from Kain and Fauth (1977).

Results of a study by Lee and McNally (2003) addressing the structure of weekly activity/travel patterns show that travels of short and long duration produce different patterns with regard to types of activities (work events – work and school; and non-work events – maintenance, shopping/services, recreation/entertainment and social). Defined as sequence of out-of-home stops, travel's tour is divided into two categories namely tour with single stop (multi-activities take place at one particular stop) and tour with non-single stop (activities occur at different places). Using an almost similar method as Doherty's and Miller's (2000, as cited by Lee and McNally 2003) realistic planning conditions to observe household's behavior scheduling with regard to travel planning, Lee and McNally (2003) found that structured travel (before week planning and within week planning) tend to be activities with long duration (both tour with single stop and tour with non-single stops) while opportunistic travel (within day planning and spontaneous planning) tend to be activities with short duration. Findings supported Cullen's and Godson's (1975, as

cited by Lee and McNally 2003) activity-peg proposition where certain activity occurs in daily schedule acts as 'pegs' around with others activities are planned and scheduled earlier.

Other than that, decision for visiting places is not necessarily has to be pre-determined, it is more likely to be impromptu decision with higher propensity increased as stop sequence increased. However, the proportion of opportunistic stops decreases as travel time increases. The former results are much similar to Svenson's (1989) and Chen's (2001) findings with regard activity schedules are often 'incomplete'. In addition, findings also indicated that though being planned beforehand, in-home activities tend to be improvised from time to time and people do not intentionally schedule non-work events unless the duration is of a certain length. Moreover, when analyzing maintenance; recreation and shopping; study found out that none of these three factors is expected to be stand alone independently. That is to say that each of three events are planned and scheduled depending on the other two events.

Interestingly, Black (2001) in 'An Unpopular Essay on Transportation' sought the clear conclusion with regard to several popular notions which exist in the transportation and transport geography literature. As some of the developing countries believe in the 'globalization and traffic flows' approach to overcome traffic congestion (see Zakaria 2003), Black proved that globalization is all about responses to some economic incentive such as low wages. Sharing much similar assumption is Gabel (1994 as cited in Black 2001) where he quoted that '...As trade extends in geographical reach, transportation rises as a proportion on international production. And although the world economy is now highly integrated, further liberalization of international trade can be expected to increase transport inputs per unit of international product, *ceteris paribus*'.

Just like 'globalization and traffic flows' approach, 'construction of the missing links and networks' approach deemed to be one of the workable approaches to alleviate traffic congestion as well as other transportation issues (see also Eighth Malaysian Plan 2001-2005 Report and Kuala Lumpur Structure Plan 2020 : Transportation). Seeing this from different point of view, Black considered this approach nothing more than 'the new network will do little to stimulate the economics of Europe remote areas'. Black supported this statement with illustration of the relationship between average path length and network length where Black firmly stated that 'as a network's length increases, there are very few gains in terms of reducing the average length of the shortest path and at some point the gains may cease prior to complete connectivity'. Black concluded that geographic area covered by the network has to be changed if one's relative location is to be upgraded. In a way, this notion is similar to the concept of distance enterprise and transborder telecommuting work arrangement (Herman Miller 2001, Vittorio Di Martino 2001 and Derrick J. Neufeld and Yulin Fang 2004).

Sought to understand car travel from the economy perspective, Dargay (2006) focuses on the effect of prices and income on car travel in the United Kingdom. Based on the fact that some factors (pervasiveness of habits, inertia, imperfect information) takes place over time to influence car travel and the response to changes in circumstances (income, personal circumstances, transport supply and prices) does not occur instantaneously, Dargay tried to draw conclusion with regard the factors determining household car travel especially the effects of the abovementioned parameters (issues). By using pseudo-panel data (one of the repeated cross-section data methods) which is of longer time periods than panel survey and providing more detailed information on individual behaviour and circumstances, Dargay attempted to analyse household car travel by investigating the effects of fuel prices, vehicle fuel efficiency and income on car travel. Assuming that, on average, fuel prices and fuel efficiency are the same at any point throughout the study period, study found that:

1. Total expenditures increase up until the household's head reaches late 40s and decline thereafter. This is also largely depends on the number of adults member in one's households where an addition adult increases the household's car travel which will lead to increase in total expenditures.
2. Income has a significant positive influence where car travel responds more strongly to rising incomes than it does to falling income. That is to say that when the income decreases, car level use fall slightly than normal standard.

3. The level of car travel is said to increase even during the period of fallen income and will continue to do so until saturation is reached. Study noted that this is largely contributed by habits and personal circumstances factors where people tend to opt for technology which will satisfy their need best (see also Simich and Gilbert, 1998).

It is also noted that income has a significant effect on use per car where the use level decreases when income falls and vice versa. Further, costs of ownership and motor fuel have negative effect on car travel where when prices of these two components increases, the level of car travel decrease. In contrast to Holtzclaw's studies (1990 and 1994 as cited by Handy, 1996) where 'modest difference in income between neighborhoods should make no difference in the analysis' as well as 'average income proved to have an insignificant relationship with either auto ownership or total automobile travel', Dargay (2007) concluded that as the next generation secured a certain level of stable income and slowly grow into successive cohort than the previous generation; motoring has become more prevalent and widespread.

To date, studies on the link between urban form and travel behavior results in a number of findings. Handy (1996) presented some of the previous studies' results with regard land-use impacts on travel behavior. A comparison of travel patterns between different neighborhoods by Friedman et al (1994) results in 'higher percentages of transit and other non-automobile use in traditional neighborhoods' but on the other hand, Cervero and Gorham study (1995) confirmed that transit neighborhoods have a higher use of transit. Frank and Pivo (1994) provide evidence that urban form variables were significant for predictors of travel patterns and different aspects of urban form were significant for different types of trips. This study is supported by LUTRAQ 1993 findings where results demonstrated as the pedestrian environmental factor (PEF) increases, a significant decline detected in vehicle miles travelled and at the same time an increase in the percent of non-automobile mode shares. Furthermore, LUTRAQ study indicated that 'pedestrian-friendly neighborhood which surrounded by automobile-oriented suburban development, do not generate the same level of non-automobile use as pedestrian-friendly neighborhood surrounded by other pedestrian-friendly neighborhoods'.

3. CONCLUSION

'Travel is not purely derived' hypothesis can be validated if the same choice(s) will be made in the same situation(s) given that Hauser (1978 pg 409 as cited by Mokhtarian and Bagley, 2000) points out '...if individuals make repeated choices and do not always select the same alternative, then $p^2 = 1$ is not possible'. A finding of Rutherford's, McCormack's and Wilkinson's study (1996) indirectly holds the conventional wisdom 'traveler's attitude does affect travel'. Same results can be found through Mokhtarian, Salomon and Redmond (2001) as well as Mohamad and T. Kiggundu (2007). As major percentage of travel trip made is derived from private vehicle, questions like 'assuming there are no work-related constraints and non work-related constraints, how much would you like to travel and by what means' and level of opportunity accessibility-related questions for example the total number of relevant opportunities, the spatial distribution of opportunities, individual's spatial location and individual's ability to overcome spatial separation will help to a broader picture and a better ground of understanding the travel.

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